THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

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VOL. XIII. NO. 5: MARCH 2, 1916

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PUBLISHED FORTNIGHTLY BY

THE SCIENCE PRESS

LANCASTER, PA.

AND

NEW YORK: SUB-STATION 84

THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

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Subscriptions and advertisements should be sent to THE JOURNAL OF PHILOSOPHY, Sub-Station 84, New York City. The annual subscription price (twenty-six numbers) is $3.00 and the charge for single numbers is 15 cents. Advertising rates will be forwarded on application.

Entered as second class matter, January 19, 1904, at the Post Office at Lancaster, Pa., under Act of Congress of March 3, 1879.

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VOL. XIII, No. 5. MARCH 2, 1916

THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

A NOTE ON THE SENSORY CHARACTER OF BLACK

SOME years ago Professor Ward published an article entitled "Is 'Black' a Sensation?"[1] The question was answered in the negative. Ward believes with Fick that we perceive black objects, but that darkness is simply the zero intensity of the sensible quality "light"; so that what we may call the "sensory content" of blackness and darkness is in reality "the absence of visual sensation."

Ward's arguments have never, so far as I am aware, been met by a rejoinder; and the principal reason, as I venture to think, is that his article broaches an extraordinary number of controversial topics. A full consideration, *pro* and *con*, would fill a small volume. I believe, nevertheless, that the definitely psychological arguments may be discussed within decent limits, and I attempt their discussion in the present note. Ward, in fact, supports his conclusion by two closely interwoven, but logically distinct, lines of evidence: by direct appeal to psychological observation, and by a review of visual theories. On this second path I shall not follow him. For whether Helmholtz confused sensation with perception, whether Hering's physiology is adequate to the psychological data, whether Wundt changed his mind between 1874 and 1905,[2] whether Müller is more ingenious than convincing—all these questions, acutely as Ward debates them, and necessary as their discussion may be to an historical setting of the psychological issue, are really irrelevant to that issue itself. The important question is whether what we call "the blacks" or what we might also, but for habits of expression, call "the darks" are positive qualities of visual sensation.

We are primarily concerned, then, with the appeal to observation; and we should naturally expect to find in Ward's pages a somewhat detailed study of the visual phenomena in which black plays a part. As a matter of fact, not much is said of vision; Ward prefers to go further afield; and what is said is not always beyond

[1] *The British Journal of Psychology*, I., 1905, pages 407 ff.

[2] Wundt has replied on his own behalf in *Psychologische Studien*, II., 1906, pages 115 ff.

challenge. We are told, for instance, that "in a light-field many colors may be distinguished, but in a dark field none." Yet "light admits of indefinite increase," and "ranges in intensity . . . up to a dazzling brightness that becomes painful and blinding"; these are Ward's expressions; and Helmholtz had written in 1867 that "with increase of brightness all the simple colors approximate white or whitish yellow." We are asked again (the question occurs in the polemic against Hering): "who ever heard of a blinding black?" Yet Ebbinghaus, writing in 1897 of general adaptation, parallels "dazzling brightness" with "impenetrable blackness": "you have spent the evening in a good illumination, and now you set off home; everything out-of-doors looks impenetrably black; you are at a loss to know how you are going to find your way." The "impenetrable" black that follows upon intensive light-adaptation is definitely "blinding" in its effect; I should not hesitate to apply that adjective to it; and von Kries comes very near the actual term when he remarks that "at first we can not see anything at all."

These two samples may suffice for the present to indicate the treatment of vision: Ward's chief reliance is on the analogy of darkness to silence. Here again he follows Fick, who wrote in 1879: "I find this process [the darkening of a white paper to black] precisely analogous to that in which a particular tone is heard with diminishing intensity until at last it disappears in complete silence."

Let us see how the analogy is used. Where the cessation of sound is striking, Ward remarks, "everybody speaks of the cessation as audible." I do not think that I have ever come across the phrase "a silence that could be *heard*"; the regular expression, surely, is "a silence that could be *felt*."[3] This, at any rate, is the only correct verb to apply to a silence which follows upon loud noise. I have made a number of experiments by subjecting observers, trained and untrained, for a period of 30 seconds or more, to the noise of machinery in my laboratory workshop; at the end of the set period the noise was cut off as abruptly as possible. Various organic and kinesthetic sensations are reported, most frequently a slight dizziness and a change of breathing; but all observers find an "oppression" in the region of the drumskins, a "boring" in the ears, a "pressure" in the ears, a "pushing" at the ears, a "feeling as if the ears would burst," and so on. Silence, under these conditions, is not auditory, though it is largely auricular.

[3] I am sure that I have read, in works of travel, of silence which (like darkness) could be "felt"; I connect the phrase in particular with the silence following an earthquake. But I can give no reference; and the Dictionaries of Quotations that I have consulted mention neither audible nor palpable silence.

"Nobody would object to defining silence as the absence of all sound," Ward observes, "till he had shown beyond question that it was something more." But in the cases of which I am speaking silence is dissociated both from sound and from its absence; a noise is succeeded by a "feel"; silence, as experienced, is something *else* than sound or the cessation of sound.

If, again, an observer is asked to describe the course of consciousness during a period of time which includes the objective cessation of a weak and continuously decreasing sound, he invariably reports, at the moment of subjective cessation, a marked change in breathing and the relaxation of muscular tensions in head and face; oftentimes, a weak emotion of relief. The organic and kinesthetic feels are, here too, the sensory materials of the perception of silence; and there is no direct realization of an auditory blank such as seems to be implied in Fick's account.

It is true, on the other hand, that if one listens in an objectively quiet place one may catch Preyer's entotic phenomena. I have often verified the observation, in myself and others, when sitting late at night in an inner room of the laboratory. Only one is then listening for—sound; and sound is what one hears, not the "absence of all sound."

Such are the sensory data of silence as they may be observed under simple experimental conditions. The apprehension of silence may occur, of course, in far more complicated settings. Thus, according to Ward, who is now criticizing Stumpf, the "perception of silence wakes the miller when his wheel stops and the clerk when the sermon is ended." Here, however, we must analyze a little more closely. What the miller directly perceives, if his wheel stops in the daytime, is dizziness and ear-pressure. I have noticed these things, at some degree of intensity, when passing from a noisy train into an unusually quiet snow-blocked street, and when the engines of a liner have stopped in mid-ocean. So far the parallel is fairly close, for the mill vibrates as do the train and the boat. But on a calm sea I have slept uninterruptedly through a stoppage of the engines; and the miller might sleep as soundly if he had no special interest in the mill. The various organic stimuli have power to wake him for the same reason that the baby's cry has power to arouse its mother, or the groan of her patient the sleeping nurse, or a mere hint of the scent of fire the dozing watchman. Complex sets and adjustments are here in play, and it is only a Podsnappian flourish that can dismiss the facts to a psychology of perception. As for Fechner's sleeper, he too has his cues: the preacher's change of intonation as the sermon ends, the incipient stir and rustle of the

more wakeful members of the congregation: but it is the fear of ridicule or of social condemnation that has given the cues their sanction. When the whole congregation sleeps, "worldly Tom and Bob and Billy" all together, then Sir Macklin may be removed without disturbing their slumber.

From these considerations it sems to follow that the meaning of silence may be carried consciously in a number of ways: by faint sounds, by dizziness and ear-pressure, by release of breathing and of muscular strains. There are, very likely, cases in which it may be carried by the feel of walking on tip-toe, or may be reinforced by such visual impressions as monotony of color, signs of previous habitation, etc. All this, we may grant, stands upon the level of perception. But when the silence becomes significant, and we enquire for the conscious processes which carry the meaning of a significant silence, then we have passed beyond perception to the levels of association and attitude and acquired interest. Unfortunately, the group of experiences to which this particular mode of apprehension belongs has not yet been brought under experimental control.[4]

There is yet another point in Ward's criticism of Stumpf upon which it seems necessary to comment. We often have a non-auditory consciousness; we may have it under conditions of external quiet, and we may have it despite the presence of fairly strong auditory stimuli, as when we are utterly absorbed in some sight. We are then, for the time being, deaf. In the same way, when we are utterly absorbed (say) in music, we may be, though our eyes are open and are variously stimulated, temporarily blind. Under such circumstances it seems to me that we fail to hear and fail to see with our ears and eyes precisely as we do not hear and do not see with our hands and feet; the distinction here of privative and negative terms is psychologically meaningless; privation, so far as consciousness is concerned, is nothing else than absence. Stumpf has confined himself to the simplest case, that of the "absence of external stimulation"; and Ward counters by the remark that "when there is nothing to hear we do not say that we do *not* hear in the sense in which we say this of hands and feet." The rejoinder is doubly warranted: for consciousness when there is nothing to hear may still be auditory, and if it is not we may have a positive feeling of privation. But when we are looking back, retrospectively, at a non-auditory consciousness of the kind I have described above, we are, surely, ready to say that we did then no more hear with our ears than with any other part of our body.[5]

[4] Cf. my "Feeling and Attention," 1908, pages 199 ff.

[5] There are, no doubt, many occasions of this general kind when, in reply to the exasperated question "Didn't you hear me calling?" we say apologetically

I come now to a portion of Ward's discussion that I find very puzzling. Ward supposes that "we succeed in finding a dark gray to match" the gray of the *Eigenlicht*. "A strip of such gray on a white ground yields a sensation that is darker still." That would, of course, be the immediate result; and we should have a case of what Hering calls simultaneous contrast or simultaneous negative light-induction. Ward then rightly argues that the physiological mechanism of the contrast-effect is, "so far as psychological description is concerned, wholly irrelevant." He proceeds as follows: "Leaving physiological differences aside, we can at least clearly imagine a parallel in the case of sound, which would hold good psychologically, at all events. Suppose we hear a loud sound of constant intensity and quality and simultaneously a much fainter one of different quality. Let the intensity of the latter steadily diminish and the contrast in intensity between the two sounds will steadily increase; and there is *a priori* no reason why we should not attribute this growing contrast to the increasing stillness of the waning sound." I suppose that the louder sound here stands for the white background, and the weaker for the dark gray. But where is the parallel? The gray on the white ground does not grow continuously darker; on the contrary, it gradually lightens (simultaneous light induction). The two sounds, heard together, if tones, would assuredly either blend or beat; and to call a difference of intensity a "contrast" simply begs the question. Furthermore, to "attribute a contrast to" something is to try to explain that contrast, while we were invited to leave explanation for psychological description. And finally, to ascribe "increasing stillness" to a waning sound is to imply that stillness may be perceived as an auditory blank, that its "sensory content" is the "absence of auditory sensation." But this is the very thing to be proved, and we have seen earlier in the present note that the evidence is against such an assumption.

What, then, of Preyer's saying that "just as black is a sensation indispensable to painting so is the rest a sensation indispensable to music?" Our first comment must be that it is unhappily worded. For black is not indispensable either to the painter's palette or to the critic's eye. Out-of-door painters use black pigment very little indeed, and indoor portrait-painters make very varying, individual and manneristic use of it; while one may pass in review a whole wall of pictures without once getting the sensation (or perception!)

"I believe now that I did hear something." I am referring, however, to the extreme, but (for certain persons, at any rate) not infrequent cases, when we say "No! I didn't hear a thing."

of black. It is otherwise with the rest; music, whether we regard it from the composer's or from the hearer's standpoint, depends upon the rest, as it depends upon the hold, for a variety of effects. But these effects are, in the first instance, esthetic, not psychological; and the psychological facts upon which they are based must be worked out, experimentally, in the different cases. Meumann, writing from a wide experimental acquaintance with rhythms, remarks: "Especially striking is the rhythmical effect of the different kinds of 'rests.' . . . The causes of this effect of the rests are an important subject in the psychological investigation of rhythm. I am disposed to ascribe it essentially to the influence of central adaptation to the change of attentional energy, or, in other words, of adaptation to the succession of tones which had been maintained up to the beginning of the rest. In consequence of this adaptation there arises at the beginning of the rest a definite expectation of a similar tonal sequence, and the non-fulfilment of expectation seems to give the rest its peculiar attraction."[6] This view is offered, no doubt, merely as a general impression; it would have been elaborated and, in all likelihood, modified in later articles, had Meumann been able to carry his labors to completion; I do not myself regard it as adequate. It illustrates, however, what I take to be indisputable, the complex and positive character, psychologically considered, of the rest-experience. A filling by expectation and disappointment is very different from a sheer auditory blank, very different even from a shaped and perceptible auditory blank.

And what, lastly, of Mach, and his parallel of time-shapes with space-shapes? I turn to the paragraph from which Ward quotes, and I find its opening sentence to be this: "I conceive it to be beyond question that there is a peculiar, *specific time-sensation.*" One might perhaps hesitate, after reading the text of 1886, to decide whether Mach recognizes simply a specific sensation of succession, or whether besides this (and possibly given with it) there is a specific sensation of duration. But the text of 1900 is explicit. "If a tone *A* is followed by a color or a scent *B*, one is always sure that *B* followed *A*, though the estimate of the interval separating *A* and *B* is not materially influenced by the quality of these sensations. It must be, then, that another and distinct process is involved, which is not affected by variation of the sensory quality, but is completely independent of it, and by which we estimate the time." The alternation of sound and silence is thus, for Mach, an alternation, not of sound and nothing, but rather of sound-time and

[6] E. Meumann, "Untersuchungen zur Psychologie und Aesthetik des Rhythmus," *Wundt's Philos. Studien*, X., 1894, page 309.

of pure (sensory) time; the "blank" interval has a specific time-content.

"Blue and green," says Ward in his concluding paragraph, "are both positive sensations, because both have assignable stimuli and can occur in any order and independently: black is not a positive sensation, because it has no assignable stimulus and depends solely on the cessation of light, internal or external." But is not the "possibility of assigning a stimulus" irrelevant to psychology? Is not that Ward's own view in other contexts? "If we are to come to the study of our visual sensations without any prejudice, then we must know nothing whatever of the fact that objective light corresponds to white but not to black." That is Hering's statement; but the spirit is surely Ward's as well as Hering's: "the simplest way"—and psychologically the only way—"is to let the facts speak for themselves." But "blue and green can occur in any order." If we are speaking of human vision as it is to-day, then so can black and white; we may see white before black, but we may also see black before white. If we are speaking genetically—well, then we are speaking speculatively. Blue, I take it, appeared earlier than green; and black and white appeared together. Ward too assumes that the primitive sensation of sight consists of a "light" which ranges from complete darkness to dazzling brightness; and as, for reasons to be given later, I can not distinguish between "complete darkness" and black, further argument at this point is needless. "Blue and green" once more "can occur independently." So, in a given visual field, can black and white: a figure may be shown either in black or in white upon a gray or colored ground. Or are we here leaving psychology for physiology? Then, truly, black and white are interdependent, but so also are blue and yellow, green and red; and are not blue and yellow, for instance, positive sensations? Lastly, "black depends solely on the cessation of light, internal or external." Surely an unguarded statement! The "cessation or inhibition of the intrinsic light" is an hypothesis of McDougall's; and it is an hypothesis to be considered; but it has hardly yet attained the rank of established fact. A black, again, will appear on the cessation of external light, provided that the eye is already light-adapted and that the cessation is sudden; if the eye is dark-adapted, or if the external light is gradually reduced (as in twilight), there is no vision of black. Conversely, our ordinary vision of blacks requires the presence of light: Ward writes, in another passage, that Hering has shown "the so-called sensation of the deepest black" to be "possible only under the influence of light."

What, then, are the positive reasons for attributing a sensory character to the blacks? I should say that they are to be found in all the elementary phenomena of vision. These qualities take their proper place on the vertical axis of the color-pyramid, and serve as end-points of chromatic lines within that structure. The facts of adaptation, general and local; the after-effects of adaptation, namely, a modified "sight" or "sightedness" and the negative after-image; the facts of visual contrast; the facts of indirect vision —these are all phenomena in which the blacks play a positive sensory part. They are also phenomena which may be observed, not only by help of black "body-colors," but also when these are replaced by the darkness of an unlit space, such as the interior of a black-walled tube; there is no ground for separating the blacks from the darks. In short, black or dark, so far as we are dealing with sheer looks, is no more the zero-point of white than blue is the zero-point of yellow; and when we proceed to experiment, black or dark behaves just as other acknowledged qualities behave. I can not see that further psychological evidence is necessary.[7]

We should all, nevertheless, welcome an *experimentum crucis.* And there is a hint of one. "Apropos of an experiment which he has described," says Ward, "Professor Müller maintains that it is 'altogether inconceivable' how this experiment is to be explained without assuming the positive character of black. Yet Professor McDougall seems to have done this satisfactorily, and even to have turned the tables by experiments of his own which give results incompatible with theories of a special black-process." Müller is in truth concerned with a *besondere S-Erregung,* not directly with the positive character of black as sensation; and it is on this ground that McDougall meets him. In other words, the experiment is, in the present connection, explanatory rather than descriptive; it bears upon physiological hypothesis rather than upon psychological observation. Since, however, psychology is involved, we may properly give it some consideration here.

Müller's experiment is well-known; he puts a black-red ring upon black and white discs, and finds that the red shows well on the black, and is hardly perceptible on the white. "In order to obtain light" upon this result, McDougall puts a gray-red ring upon gray (the same light gray) and white discs, and finds that the red shows well on the gray, and is hardly perceptible on the white. He then argues that contrast-black ought, on Müller's view, to have enhanced

[7] It may be remarked that Ward, though his effort to distinguish sensation and perception is wholly justified, tends to overestimate the rôle of stimulus. Whether a black figure, a "shaped" black, shall arouse in the observer a sensation or a perception depends (other things equal) on the observer's attitude.

the red on white, by bringing the gray of the gray-red ring nearer to neutral gray. He has, however, forgotten the *Axiom der Mischempfindungen.* Had he put his gray-red upon black, as well as upon its own gray and upon white, he would have found that the red shows best upon gray, *less well on black,* still more poorly on white; and had he put Müller's black-red upon his own gray, as well as upon black and white, he would have found that the red shows best on black, *less well on gray,* hardly at all on white. (These statements hold, at any rate, for the Hering red, which is definitely lighter than McDougall's light gray.) You can not, that is to say, if you are to get to a positive conclusion, take casual mixtures of light and color (casual gray-reds) and set them upon casual backgrounds of gray; before you work with grays, you must know the course of the chromatic limens, or must know at least the general tendency of that course. We do not, any of us, know either course or tendency; we know astonishingly little of the chromatic values of our colored papers; but we know enough to realize that the knowledge, in a case like the present, is essential to positive argument. Müller himself chose black and white with a reason; he chose them because they were, in the rough, the extremes of the light-series, and therefore gave him a maximal difference of light-excitation. Whatever, therefore, we may think of Müller's "altogether inconceivable" and of the crucial character of his experiment, we must recognize that the force of his demonstration is not impaired by McDougall's counter-experiment.

E. B. TITCHENER.

PERCIPIENTS, SENSE DATA, AND THINGS

THE perennial interest and difficulty of the problem as to our knowledge of the external world is very strikingly shown by the various attempts at a new treatment of the problem in the work of the American "New Realists," in the writings of Professor S. Alexander, its frequent treatment in recent proceedings of the Aristotelian Society, and in Bertrand Russell's "Our Knowledge of the External World."

My own humble contribution to this discussion will be a defense of realism, modified only by insistence on the organic and functional interdependence and correlation of percipients and perceived objects.

One must start with analysis of the simplest kind of knowledge of external things. It will not do to import physical and psychological speculations at the beginning of such inquiry. Speculations

in this field must justify themselves, if at all, by rendering the facts of immediate experience more consistent. Putting aside all sophistication through theories, I find in my immediate apprehension of such things as the tree or the table only two factors, neither of which is reducible to the other. I find the object which I immediately apprehend as real, and the consciousness that I (whatever I may be, whether spiritual Ego or flux of cortically determined processes or mixture of both is now an irrelevant question) apprehend the object. I see that the tree is determinately round, brown, rough, about two feet in diameter, with branches and green leaves. I may call it a complex of sensory or perceptual qualities, but I do not mean thereby that it is a state of my consciousness.

I do not find that I have, as distinguishable factors, sensations which are purely mental processes and sense data (as does Mr. Russell). I am convinced, after prolonged reflection, that the assumption that sensations exist as mental processes has been responsible for most of the difficulties and confusions connected with this problem. I have "feelings" of esthetic joy at the tree's beauty, feelings of pain if a branch blows down and hits me. These feelings are subjectively mine, just as hunger, love, friendship, and all my other emotions. I suppose these "feelings" to be in part, perhaps wholly, due to modifications of my body acting on my conscious self. Perheps they result from the reaction of my psychical self to occasioning stimuli. Perhaps my psychical self is simply and solely the by-product of the action of a complex neurone-system. I am not concerned here with the metaphysical problem of the self and the body. Feelings and emotions, then, are subjective processes, belong only to this Ego. On the other hand, the sensory qualities of the objects which I immediately apprehend are *in the objects, not in my Ego.* They constitute the object in its objectivity. Mr. Russell says that all that I really see is a patch of color. For my own part I do not immediately see merely a patch of color. I see an object having determinate color, form, texture, etc., all blended together.[1] I can not perceive the one without the other. If I feel the tree in pitch darkness I do not perceive only a tactual surface sensation. The so-called sensations are artificial constructions, which the psychologist has invented in order to account for the genesis of perceptions out of simpler elements and for their multiform variations. Sensations are on the same footing as electrons. The psychologist is prone to say that we learn to perceive concrete objects by correlating visual, tactual, and other sensations. I hold that, from the very outset, and in the case of the vaguest perceptions, we

[1] I do not, of course, mean that there are no mediate factors in my perceptions.

immediately apprehend objective complexes of qualities, and that we learn to perceive better by discriminating and correlating objective complexes, by differentiating and relating their features more fully by analysis and synthesis, thus causing them to stand out more clearly from the vaguer background of the total external reality immediately apprehended. This vague continuum of reality is always the matrix of our determinate perceptions. Perceptual knowledge grows out of a vaguer, less discriminated, and less clearly correlated or coordinated immediate or intuitive knowledge. I do not believe that any baby ever had a purely visual and a purely tactual space, which it correlated. It had what, in psychological terms, we may call a vague and circumscribed visuo-tactuo-motor space field, which it analyzed and synthetized into a more definite or articulate spatial system. So with all of us. If we start with the assumption of sensations, which are just Humian "impressions" as the sole immediately given, we may argue from now until doomsday and we shall never be able to prove that there is an external world. Having started with an epistemological fiction, no wonder we can not get to reality. I suppose sensations were invented, among physicists and philosophers, as a convenient makeshift to account for the variations in human perception, and especially for those features of immediate reality which could not be conveniently measured, as well as for errors and illusions of all sorts. In time, like many another human makeshift, they have acquired the sacrosanct authority of a dogma. As to whether psychology still has need of them, as useful fictions, I leave to the psychologists. I opine that the behaviorist and the functionalist, when they are thoroughgoing, may find that they can dispense with them, except perhaps as pedagogical crutches.

Since I have no sensations, only feelings and immediate apprehension of objects, as complexes of sense qualities, I do not need to suppose that sense data *cause* sensations. I see no convincing evidence that the relation between my immediate apprehension of the tree and the tree is that of effect to cause. They are simultaneous in time and identical in nature. There is more in the tree than I apprehend, but that more is not inconsistent with what I apprehend. If you say that my apprehension is not of the tree as it is in itself, since the tree looks different from different positions and to different observers, I reply that there is no tree in itself as an isolated object and no observer as an isolated subject. Trees and observers are elements in a total spatio-temporal system of interacting things. I have good reason to believe that my being aware of the tree depends on my visual apparatus and on the light in the intervening and surrounding atmos-

phere. The sensory organs and the central nervous system are media of communication between my Ego and the tree, just as the atmospheric light is. If there is variation in any of the media of communication there will be variation in the object apprehended. If it were cloudy I should not see the tree so distinctly. If my eye were defective a similar result would follow. Similarly, this paper does not cause me to write this article. It and this JOURNAL are media of communication between my fellow students and myself. With reference to my cognizing Ego, my nervous system and end organs are just as truly parts of the external world as are the intervening lighted space and the tree. With reference to pure cognition, my whole body is an object in space, among other spatial objects. With reference to my feelings there is a peculiar and intimate relation between this body and my conscious Ego.

The sensory system is a means for enabling a center of consciousness, which, as unitary center of feeling and cognition, is associated in some kind of functional interdependence with a cortical nervous system, to go out into circumambient space and to apprehend the qualities and relations of things. The awareness of external things, as well as the awareness of one's own bodily states, is probably conditioned by cortical changes; but to say that awareness is merely a cortical change is to confuse two qualitatively distinct things. Some cortical change must occur without accompanying consciousness, and the cortical changes which are associated with acts of awareness, with feelings, desires, and voluntary acts, are unique kinds of cortical change by virtue of that association.

Is my mind out there where it apprehends the tree? If so, how can my mind be in my body and over yonder at the same time? The simplest solution of this problem is to admit that my mind is wherever it perceives anything. It is partly out there and partly in my body, since, while perceiving the tree, my mind is also conscious of the straining of eyes and head muscles, conscious that as a psychophysical organism I, as cognitive Ego, am attending to the tree. My mind, as actually conscious, is cognitively wherever the things that it apprehends are. Affectively and volitionally it is always centered in my body. Is it then in China, when I think of China? No. For I am conscious that my thought of China is not an immediate apprehension of China, but a mass of centrally located images. As contemplating or immediately apprehending things, the mind is translocal. To a limited extent and conditioned by light, air, and other media it traverses space with immeasurable velocity. Cognitively the mind is in the body only in so far as what the mind apprehends is its own bodily state. Affectively and volitionally the mind is, to a much greater extent, in the body since both the in-

citements to purposive action and the immediate instruments thereof are bodily. The body is chiefly, perhaps, a means of action. It is also certainly a condition of the mind's apprehension of what is spatially beyond the body. But it is not properly described as a cause of that apprehension, except in a very loose sense of the word cause. Nor does the sensory nervous system necessarily distort the nature of what is beyond itself. It is just as consonant with the facts, and much more in harmony with the conditions of a coherent theory of knowledge—one that does not begin by throwing away the common-sense conviction that we really perceive real things, as though the man in the street were a fool—to say that the sensory nervous system is the medium through which the mind goes out into space and travels around in it as to say that this system is the means by which the external world effects a burglarious entrance into the mind. Surely it is less repugnant to the actual nature of perception to suppose the mind to be a pervasive system or self-expanding entity that goes out into space than to suppose that the whole material world, in order to get perceived, must be concentrated into a dimensionless point somewhere in the brain.

Do I perceive the tree in one private space and you in another private space? Mr. Russell, in his very ingenious treatment in Chapters III. and IV. of "Our Knowledge of The External World," supposes every percipient to be like a Leibnizian monad which takes only private views of things. He defines the "thing" as the series of its aspects, and, starting from the series of aspects which constitutes every individual's private views of the thing, he constructs a perspective space, which seems to be the space to which, in some way, every one's series of private space-views refer. I am not at all sure that I follow all Mr. Russell's argumentation on this point. But it seems to me that his construction of a general perspective space is plausible only on the assumption that he already knows that other minds exist, and it is admitted that the existence of another mind is an inference from the existence of another body. But how do I know that your body exists as the habitat and instrument of your mind, unless I already know that there is *one public space* in which your body and my body coexist? At the present moment, for example, I am not, so far as I am aware, in the immediate presence of any other mind. I am apprehending objects within my range of vision. Then in walks my wife and fills up part of this field of vision. Her body has entered that part of public space which I immediately perceive. She obtrudes herself upon my notice and speaks to me. I interrupt my work to reply. Unless I immediately apprehend space as the place of the simultaneous existence and interaction of things I certainly could not apprehend my wife's reality.

A perspective space can not be deduced from "private spaces." For, if we begin with self-enclosed private spaces we can never logically get into the public world and can never find any other mind. The other self—body and mind—must exist in public space. I believe that my wife exists because I immediately perceive one indivisible object—body and soul—in public space. I am not conscious of inferring by any process of ratiocination that her soul is there. I am immediately conscious of a living body which behaves in an intelligent and affectionate fashion. Of course I may be mistaken about her views or feelings on some matters. Then, in trying to find out what she does think or feel, I learn that knowledge in detail of another's state of soul does involve inference. But the immediate apprehension of minds and of the portions of space in which they live and express themselves are two aspects of the same realistic contemplation of things as they are. My knowledge of another mind's existence is logically as "primitive" as my knowledge of my own mind's existence. In both cases, for completer knowledge, I have to reflect, analyze, and infer. It is often quite as easy to know another's mind as to know one's own mind.

Psychological or "private" spaces, are, like sensations, of which indeed they are the "subjective" places, artificial constructions. They are not given, but constructed as the "imaginary" places for the variations in sense-perceptions. It is true that our spatial, like our other qualitative, apprehensions of things, vary. I do not perceive the surroundings precisely as my wife does. But, in so far as these differences of perception are due to differences of position and differences in the structures of our respective sensory apparatuses, the differences, too, are parts of the objective order of things in space. In so far as these differences may be due to differences in our mental histories they are parts of the past objective order which, through memory, functions in the present. In so far as they may be due to inherent psychical and physical differences in the make-up of our respective individualities they are due to what, for epistemology, must be regarded as ultimately real facts.

There is no difference in perception which is not a difference due to the fact that the real world is a system of interacting elements or *individua* of varying degrees of structural complexity. If there be such a thing as a psychical or spiritual principle of individuality, then your individuality and mine are true parts of the objective order, and your private views of things and mine are private only in the sense that one is the consequence of your individuality and position and the other is the consequence of my individuality and position. But individuality and privacy have no meaning except in relation to a public world and as parts of the whole apprehended reality. The real percipient, like the real object perceived, is never an isolated

datum of experience. Just as a physical thing is a sensory complex attended to and discriminated from a vague background of apprehended reality, the individual percipient and agent is a felt center of reference for all sorts of relations.

The vague background of reality which we immediately apprehend, and the parts of which we differentiate and correlate in the analytic-synthetic growth of knowledge, is always spatial (and temporal). Space is apprehended immediately as the container or medium of existence for all things and their properties. Kant and the nativists are right to this extent—that an immediate spatial apprehension is presupposed in the barest modicum of perception (and similarly with time).

But, since sensory qualities change, things when defined as complexes of sensory qualities change and even vanish away. What then is the real thing? This is too large a problem to be adequately discussed at the tail end of a journal article. I will state briefly what I regard as the right point of view for treating the problems of thinghood, permanence, and substance. In the first place a thing does not change without other things changing in the same spatial and temporal stretch. Absolutely isolated change is no more real than absolutely isolated existence. The ice does not melt unless the temperature rises above 32° F. This statement is a symbol of a multitude of other conditions of change. The changes through which a thing ceases to be the same thing involve the interaction of elements in the one spatial whole and in the one temporal continuum of reality. Just as there is one objective spatial whole at any instant, of which we apprehend only fragmentary, though genuinely real, aspects, because we are localized centers in that whole, so there must be one objective temporal order or order of cosmical succession in which the changes that we observe and the changes that we undergo are factors.

Nowhere in science and philosophy is the pragmatic method more clearly applicable than to this problem of thinghood. For what common sense means by the sameness of the thing is just the sufficient persistence, for immediate apprehension, action, and enjoyment, of those qualitative complexes which are the actual things. A thing is any groupings of sensory qualities if, and so long as, for any purpose, this grouping can be treated as a persisting whole. A thing is the same so long as a self can count on finding the same qualities together in space. I say that I have put some peaches in the refrigerator. When I go there and find the expected complex of edible and enjoyable qualities I say that the peaches have kept well. If I find a rotten mush they have practically ceased to be the same. I seek the explanation of the change from edible things to an inedible mess in bacteria. The bacteria are, for purposes of explanation, things;

not for purposes of eating. The thing of common sense is a practical construction, that is, a construction relative to a desire and a purpose, and so is every so-called theoretical construction. Even the attempt to conceive ultimate and unchangeable things, such as atoms or egos, is simply the expression of the desire to get one's mental feet planted on something permanently permanent. The degree of thinghood that any complex of sensory qualities possesses is relative to its fulfilment of a purpose. The things of physics, "atoms," "electrons," are things for the very general and abstract purposes of the physicist. In so far as they fulfill those purposes in a clear and consistent fashion he can treat them as real. But in so far as they do not satisfactorily account for the complex and changing qualities of the empirical world, which are hourly and momentarily real for the fundamental business of individual and social living, common sense is justified in holding that "atoms" and "electrons" are but artificial constructions. Even law, morality, civil polity, art, and letters are full of such artificial constructions; not of course so abstract and unreal as "atoms" and "electrons," since they have more concreteness and individuality in their interpretation and use. And, in the last analysis, the real must be the whole spatial-temporal nexus or continuum which engenders the local and transitory qualitative complexes which we call empirical things and selves. The real world must, in some way, own all the qualities which, for the fulfilment of individual and social purposes, must be taken into account; either as furthering or as hindering these purposes. The real external world owns all the primary and secondary qualities; moreover since we *enjoy* nature selflessly and "uselessly," as well as use some of its powers, the real world must own qualities akin to the esthetic features that we find in it.

Naïve realism does not imply that objects experienced would exist exactly as they are experienced entirely apart from any experient. It does imply that experiencing does not falsify or distort real things. It implies, for me at least, that the percipient as well as the qualities perceived are true integral factors in the objective complex of things. Reality is a vastly complex and changing system which engenders at some places and moments in its career feeling and reacting centers in which its qualities become consciously focused, and through which they are under modification and rearrangement, but are neither created, annihilated, nor radically distorted. A world which can produce selves must have always been a world in which selfhood was implied. A world in which selves live only through dependence on and use and enjoyment of a physical order can never have been a world of disembodied spirits or Egos, whether one or many.

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SOCIETIES

NEW YORK BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

THE New York Branch of the American Psychological Association met in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences on the evening of November 22, at Columbia University. Four papers were read, abstracts of which follow.

Some Relation Between Memory-Span, Attention, School-Grade, and Age.—CHARLES K. TAYLOR.

A series of experiments were made with about 500 children in the four upper grades of a public school, as a result of which interesting relations seemed to appear between memory-span, attention, school-grade, and age.

Groups of numbers, varying from three to twelve digits, were dictated to the children who wrote from memory each number as soon as it was dictated. While this was going on the class-room was made as quiet as possible and free from disturbing elements. Two series of numbers, ten numbers to the series, were given under these conditions. Not more than two or three children, it was found, could remember and write down a number of twelve digits after dictation, a few more remembered eleven, more remembered ten, and so on.

It was found, first, that the average numbers remembered by the different grades were larger as the grades advanced in age. It was also found that of children of the same age in different grades, those in the lower grades could not remember as large numbers as those in higher grades. Also, there was a close correspondence between the memory average of the children and their averages given in the monthly reports.

After a period of rest, two more series of numbers were dictated, similar to the first two, but this was done while the teacher read aloud from an interesting book, thus making a disturbing element. By comparing averages in the two sets of series one could gain an idea as to the attentive powers of the children.

It was found that, though there was some relation between the school-report and "attention" and the school-grade and "attention," the most marked relation seemed to be between age and attention. For instance, all of the sixteen-year children did as well with the disturbing element, or better, than with the quiet. Only 42 per cent. of the fourteen-year children and only 32 per cent. of the

twelve-year children did as well or better with the disturbing element as they did without it. With the children of eleven and under all made poorer averages with the disturbing element than without it.

Color Therapy.—T. H. AMES.

References brought together, ranging from the most ancient superstitions and folk-lore to modern material from psychological laboratories, give evidence that color was used to conciliate or ward off supernatural beings, to ameliorate abnormal physical and mental conditions and to change the emotional states of normal people.

Color acts for these ends in various ways: By magical charms or sorcery, as a scape-goat, by thinking processes, or by homeopathic and allopathic procedure.

Not only are masses and individuals affected in a similar manner by color, but also the masses and individuals of all nations and all times. The experiment by Wells in the *Psychological Bulletin* of 1910 stating that colors at the red end of the spectrum are stimulating, that those in the central part are tranquilizing, and those at the purple end subduing, agrees in its results with those to be obtained from a study of ancient superstitions.

While the uses of color never have been and may never be demonstrated to be of such value as to become commercialized, still there is sufficient evidence to warrant us in believing that apart from any purely ulilitarian or purely esthetic use, color has a place in therapeutics.

Why the Lower Senses are Unesthetic.—H. L. HOLLINGWORTH.

The speaker reviewed the various reasons that have been suggested in explanation of the unesthetic value of the lower senses. Such factors as abundance, ecclesiastic censorship, number of qualities, sharpness of discrimination, reaction time, inertia and life-span, spatial characteristics, immediate affective value, materiality, consumption of stimulus, utilitarian function, ontogenetic and philogenetic development, vividness of imagery, organization and systematic relations within the modality, social character, range of stimulus, perceptual value, tendency to adaptation, etc., were considered. Criticisms were offered of the theory that "the function of art is to please" and the intellectual character or "meaning" function of esthetic manipulation was emphasized.

A Practise Experiment.—M. J. VAN WAGENEN.

Table I. gives the Pearson coefficients between the work done at various parts of two practise periods and a final test period. The material consisted of a set of ten paired associates, the stimuli being the first ten letters of the alphabet arranged in chance order, the associates being the next ten letters, also arranged in chance order.

The subjects were forty university students in a class in elementary psychology, who practised two periods of thirty-two minutes each, forty-seven hours apart, and for three minutes forty-seven hours later.

The three-minute test was followed by another practise period on a new set of paired associates, the stimuli consisting of the original first ten letters arranged in a new chance order, the associates consisting of the digits 0 to 9, also arranged in chance order. The results are given in Table II.

TABLE I

Minutes	Period	Minutes	Period	r
4–8	First	26–30	First	.780
4–8	First	33–37	Second	.698
4–8	First	58–62	Second	.515
26–30	First	58–62	Second	.820
26–30	First	65–67	Test (third)	.880[1]

TABLE II

Minutes	Period	Associates	Minutes	Period	Associates	r
4–8	First	Letter-digit	4–8	First	Letter-letter	.615[2]
4–8	First	Letter-digit	65–67	Third	Letter-letter	.531[3]

A second experiment was carried out with a group of thirty-four summer-session university students, in which the same letter-letter associates were used as in the previous experiment, and in which the quantity of work done, instead of the time, was kept constant. During the first practise period 120 associations were made with each pair. Four weeks later 80 more associations were made with each pair. Just before the second practise period the amount that could be recalled during 200 seconds was measured, the amount being the number of correct associates that were recalled when the stimulus letters were read in varied order two seconds apart. The results are given in Tables III. and IV.

TABLE III

Minutes	Period	Minutes	Period	r
4–8	First	26–30	First	.727[4]
4–8	First	Last five	First	.753
4–8	First	4–8	Second	.541
4–8	First	Last five	Second	.604
Last five	First	Last five	Second	.845

[1] Only thirty-five subjects were present for this test. The method of rank differences was used in finding this coefficient while the product-moments method was used in finding the other coefficients.

[2] Thirty-seven subjects.

[3] Thirty-four subjects.

[4] Probably too low as the last five minutes were used in two cases where the work was finished during the 27th minute.

TABLE IV

Amount recalled	Shortness of first practise period	$r = .186$
Amount recalled	Amount done during minutes 4–8	.231
Amount recalled	Rate of work during last five minutes of first practise period	.355
Amount recalled	Rate of work during last five minutes of second practise period	.533

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REVIEWS AND ABSTRACTS OF LITERATURE

The Great Problems. BERNARDINO VARISCO. Translated by R. C. LODGE. New York: The Macmillan Company. 1914. Pp. xi + 370.

Varisco's "Great Problems" is a vigorously written and closely reasoned book. It will be differently appraised according to the different philosophical points of view of its readers; but few will deny the soundness of Varisco's definition of philosophy (p. 4) as "the search and knowledge of the supreme truth" and the correctness of his formulation (p. 8) of its aim "to render full reason for everything."

In the first of several appendices Varisco defines his present standpoint in technical terms. "To make an indeterminate profession of idealism," he says (p. 295), "is . . . like signing a blank cheque, and I have no wish to do so." In particular, he disavows every form of idealism which leads to solipsism. But with this qualification he asserts positively "I am an idealist."

A brief outline of some of the more significant teachings of the book will define more closely Varisco's type of idealism and will also provide a basis for comment. He is first concerned to defend the possibility of philosophy, conceived as search for ultimate truth, against the "critical doctrine" that reality is unknowable. "With the assertion," he says (p. 16), "that the 'beyond' is unknowable comes the affirmation that it exists. A 'beyond' of which we know the existence is not an absolutely unknown thing—is not unknowable. . . . Positive knowledge," Varisco concludes, "contains, without doubt, the solution of the Great Problems. . . . But . . . in order that positive knowledge may lead us where we wish to go . . . we must make a well-thought-out use of it" (p. 21).

Philosophical theory, Varisco proceeds, must be based simply on facts: "We must refrain from any theory which goes beyond the fact" (p. 48). And the fact first discovered is that a body, a so-called "external reality" —an inkstand or a flower, for example—is a complex of properties, that is, of sense-perceivables. But, a sense-perceivable, as, for instance, the red color of the flower, is "numerically one" (p. 32) with a sense-percept (my sensation of redness). In a word, a body is "nothing but a group of facts

of consciousness" (p. 46; *cf.* pp. 47, 290), a "unity of sense perceivables."

Following upon this discovery of the identity of bodily property and sense-percept is the reasoned conclusion, emphasized and reiterated by Varisco, that two subjects are conscious of identically the same sense-perceivable: Titus and Sempronius, for example, see the same color. Varisco's argument, often repeated (*cf.* pp. 37 ff, 227, 291–293) may best be condensed from his own statements. Any other conclusion, he points out, would involve us in solipsism, and the fatal objection to solipsism is that it would render "quite impossible" the "undoubted fact of communication" (pp. 37–38). Solipsism, Varisco is at pains to show, follows not only from the subjectivist doctrine that "the existence of the object consists in my having" a percept (p. 39), but from the dualistic teaching that the percept is "a modification of the subject determined in it by the action of an external cause" (p. 40). For if either hypothesis "were true I should be absolutely enclosed within myself . . . without possible escape. In such a case no personal subject could know *or suspect or suppose* the existence of any other personal subject, which is contrary to the truth (p. 227; *cf.* p. 292). The strength of the argument lies in the words which I have italicized. For the argument against solipsism is thus based not on an imagined assumption of the existence of other selves, but rather on the indisputable awareness, whether or not an illusion (p. 51), of these other subjects.

Varisco has so far sought to establish the existence of many subjects having sense-perceivables "in common." He conceives these subjects and sense-perceivables as "determinations of the one Being" (p. 239), as included in a "Universal Being" which "must itself be a subject" (p. 238). The argument for this conclusion is never adequately formulated, but is perhaps implicit in the statement (p. 233): "the unity of concrete objects is 'concluded' from the absurd results we obtain if we assume that [they] are not essentially connected."

The emphasized characters of this Universal Being are its fundamental unity and its observed variations. Indeed, "the variation of the universe has its root in an intrinsic requirement of Being" (p. 234). The determinations of "Being," or "concrete objects," are described as relatively independent "centers of spontaneity," or monads. and are of the following varieties: (1) "common monads" (p. 241) bound together in bodies "by laws other than the unity of consciousness, in substance by causal laws" (p. 240); (2) subjects (or unities of consciousness), which unify their sense-percepts, recollections, feelings and (notably) volitions (p. 241 and Chapter III.). Among subjects, the "purely animal" or "psychical" subject is sharply to be distinguished from the rational subject, the personal, self-conscious I (*cf.* p. 241 and Chapter IV.).

The comment which follows will supplement, at certain points, this very summary account of Varisco's teaching. Attention has already been called to the insufficiency of the argument (in the reviewer's opinion, readily supplied) to the existence of a Universal Being. The entire discussion of Being, in Chapter VII., suffers from a confusion of "qualita-

tive" with "numerical" identity. (The terms are not Varisco's.) Thus Varisco says (p. 239): "The monads as determinations of the one Being, are included in it. And they include it because each of them exists." The first sentence correctly states the inclusion of the monads within the One, the second incorrectly expresses the homogeneity, or qualitative identity, of the parts with the whole.

The main weakness of the book lies, however, in the reviewer's opinion, in the conventional and defective conception of consciousness. The elaboration of this criticism demands a more detailed statement of Varisco's position. In Chapter II., he sharply distinguishes the subject, or unity of consciousness, from the body or unity of sense-perceivables. The sense-perceivables are, he says, "independent" of the subject (p. 63) and may "realize" themselves "apart from any subject whatever" (p. 51). The law which unites them differs from the law which constitutes the unity of consciousness (p. 35). The subject seems to be treated, throughout the first four chapters of the book, as a sum of elements (sense-percepts, memories, feelings, and activities). Indeed, these are often referred to as "constituent" elements—for example, in the statement (p. 58): "the same sense-perceivables constitute my body and me—my body, so far as they are connected by a physiological law, me, so far as they are connected by the unity of consciousness." In later chapters, however, Varisco modifies these accounts of "subject" and of "body." On the one hand, with Chapter V., on "Values," he introduces a new view of the subject. Value exists, Varisco reiterates, only for the subject—for the satisfied and the dissatisfied and, above all, for the willing subject. "Every valuation presupposes," he says, "a volition which takes up a position and seeks satisfaction" (p. 139). The valuing self, however, can not, it now appears (p. 130), be a mere aggregate or "bundle of sense percepts and recollections, . . . variable in accordance with a certain law." Rather "it has" the percepts and recollections, "it lives," "it acts." "Sensations, representations, manifestations of activity, feelings," Varisco says (p. 152), "presuppose the subject of which they are the determinations. They would vanish if the subject vanished." This fundamental subject, however, the subject of cognition and not of mere feeling, is distinguished as personal self or "I" from the simple "animal" self, or unity of consciousness.

Along with this enriched view of the subject goes a conception of body which, as our preliminary summary has already shown, more closely allies body with the subject. Bodies, in truth, like subjects, are determinations of Universal Being. Bodies, like subjects, are centers of spontaneity, monads. The unity which binds them, the causal law, is not so different as at first appeared from logical law, the principle of the internal consistency of judgment; for causal laws too, "have their root in the unity of Being" (p. 240) which is Thought.

None the less, to the very end, Varisco retains the mythical conception of a "fact of consciousness" which is something other than a self or a self's consciousness, the self-contradicting hypothesis of an unconscious self, the belief that a monad can be "analogous to a subject," "comparable

to a subject," even a very simple kind of subject (p. 246) without, after all, fully being a subject. He sees clearly that the existence of anything "extraneous to consciousness, heterogeneous to consciousness, must absolutely be excluded" (p. 291), but he is blind to the fact that consciousness exists only as personal. He is, therefore, obliged to leave unsolved "the Greatest problem," whether Universal Being, or "the divine, . . . is or is not a unity of consciousness . . . transcendent with respect to the individual consciousnesses" (p. 268). Had Varisco fully carried through his analysis of actual experience he would have discovered that only as unity of consciousness, or self, can the Universal Being be either a subject or even qualitatively identical with a universe which is through and through consciousness.

The reader of this notice is referred to "The Great Problems" itself for further detail of Varisco's doctrine—in particular for his admirable treatment, in Chapter VII., of "accidentalness, however alogical in itself" as "the result of an intrinsic logical requirement of being" (pp. 235 ff), and his theory that evolution and change really characterize different systems even while "the whole remains always the same in spite of the variation of its parts" (p. 246).

In conclusion, a word must be said about the skill of the translator. The writer of this notice has had no chance to compare this version with the Italian—and has not once missed the privilege. The translator has transmitted to us the individuality of the author through the medium of an unlabored and spontaneous style.

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Problems of Conduct. DURANT DRAKE. Boston: Houghton Mifflin and Company. 1914. Pp. xiii + 455.

This book makes very pleasant reading; it is widely informative; it is genuinely inspiring. If such qualities do not represent the maximum of achievement in ethical text-book writing, they certainly come near it. These merits are due to a persuasive sanity eminently characteristic of the author, to his thoughtful awareness of the multitudinous problems that press for solution upon modern civilized society, to his forceful yet winning manner of writing.

Undoubtedly the noteworthy feature of the book is its extensive treatment of present-day practical problems—problems that concern particularly American social life and hence confront the American college graduate. The limits of a review prevent any detailed consideration of the author's views upon the various questions which he takes up in the two thirds of the book devoted to "personal" and "public" morality. Besides greater moral problems, such subjects as smoking and intercollegiate athletics, gambling and yellow journalism, pacifism and party loyalty, consumers' leagues and the single tax, are all thoughtfully and profitably discussed. Two chapters are deserving of special comment because they depart markedly from the procedure commonly adopted in text-

books of ethics. Chapters XVII. on Chastity and Marriage contains a franker and more thorough treatment of sex problems than I have seen in any ethical manual written in English. In Chapter XXI. on the Mechanism of Self-Control, the author refers to mind cure as an established fact, states his conviction that these psychical forces should be more generally employed in the conduct of life, and gives directions for the use of auto-suggestion in obtaining control of thought and impulse.

The least adequate portion of the book is unquestionably the one fourth dealing with ethical theory. Criticism is possibly out of place since it is evidently a prime purpose of the author to subordinate all questions of theory, particularly those of technical nature, to a study of the practical problems of morality. Doubts arise, however, as to the wisdom of such a self-imposed limitation on the part of the moralist. As helpful as such discussions of practical problems as we have in this volume undoubtedly are, we can not forget that many of these subjects are treated with greater thoroughness and precision in the special sciences of economics, sociology, politics, etc.

A "sound utilitarian or eudæmonistic theory" is the view that Professor Drake adopts and defends: the highest human good is the life that has the greatest total of happiness. The bottom fact of ethics is that different experiences bring different degrees of pleasure and pain. What makes one form of happiness more worthy than another is, in the first place, its greater keenness, or freedom from pain and, in the second place, its potentialities of future happiness or pain for self or others. We do not always act in ways calculated to bring the greatest happiness, but we ought to. Right living is therefore an art, the art of choosing in the present that object which will bring the greatest happiness in the end. Such in substance is the author's position. It has been frequently and, in my opinion, successfully assailed in ethical literature. Indeed, I think that Professor Drake who criticizes other theories rather severely should have taken the trouble to answer effectively the fundamental objections that have been brought against all forms of hedonism. He speaks disparagingly of epicureanism, yet is not epicureanism the one consistent form of hedonism? How is such a pleasure calculus as he recommends ever to lead to, or to justify, self-sacrifice and the complete devotion of an individual to a cause? He says that we must encourage men to venture, to take chances, in the service of great causes. But what justification can be found in his theory for any other course than that of careful prudence—choosing that line of action which past experience indicates will yield the greatest pleasure.

Beginning the book are five well-prepared chapters on the origin and development of morality. Skillfully the author traces the development of human conduct from the lower types of action. He does not, in my belief, emphasize sufficiently the features which distinguish human conduct from all forms of animal action. Even in custom, generalization and judgment, obligation and choice, play a part, as Wundt convincingly shows; to overlook them is to minimize and obscure the distinguishing feature of the moral life.

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The Psychological Methods of Testing Intelligence. WILLIAM STERN. Translated by G. M. WHIPPLE. Educational Psych. Mon. No. 13.

Stern gives here a clear and brief statement of the principles of intelligence testing. To a survey of the chief methods and results of others he adds his own criticisms and suggestions for improvement in various methods. The book is prepared more especially for teachers of normal and of backward children, for physicians and for others engaged in practical work with children. It falls into three parts: (I.) "Single Tests and Series of Tests," (II.) "The Method of Age Gradation," and (III.) "Estimation and Testing of Finer Gradations of Intelligence." Intelligence is discriminated from other mental capacities as a "general mental adaptability to new problems and conditions of life." It thus differs from genius in that genius creates the new spontaneously, *i. e.*, is not limited to adaptation, and it differs from talent in being a general capacity, whereas talent is an efficiency limited to one kind of content. Relative to the method of age gradation, the importance of the range of irregularity is discussed. In dealing with abnormal children the author also recommends the use of the "mental quotient," *i. e.*, the mental age divided by the chronological age, as the best expression for the child's intellectual status. Stern also emphasizes the need for parallel series of tests for the different years. The last part of the book treats of correlations. The author approves of the principle according to which an amalgamated rank-order secured from a group of tests is used as the index of intelligence. There are appendices and a bibliography.

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JOURNALS AND NEW BOOKS

THE BRITISH JOURNAL OF PSYCHOLOGY. October, 1915. *Psychology of Animism* (pp. 1–32): Animism originates in the belief in ghosts of men, and tends to spread as the explanations of whatever had formerly been attributed to magic. A review of the literature concerning the ghost theory, its extension to animals and plants, the evolution and the dissolution of animism is given. *The Theory of Repression in Its Relation to Memory* (pp. 33–47): ERNEST JONES. – "There exist in the mind certain inhibiting forces which tend to exclude from consciousness all mental processes the presence of which would evoke there, either directly or through association, a feeling of 'unpleasantness.'" The bearing of this theory is manifold and the subject may be divided under the headings of registration, conservation, recollection, and recognition. *The Recognition Vocabulary of Children* (pp. 48–51): G. H. THOMSON and F. W. SMITH. – The method was similar to Kirkpatrick's; 170 samples of 35,000 label words in *Chamber's Dictionary* were selected; 238 boys and 229 girls were tested to see if they understood the words. The children varied in age from 9½ through 14½ years. The difference between

boys and girls is not significant, although all the points but one on the boys' curve are above the girls' curve. *Outlines of a Method for the Quantitative Analysis of Writing Vocabularies* (pp. 52–69): G. H. THOMSON and J. R. THOMPSON. – A sampling method of estimating the size of writing vocabularies and of analyzing the vocabulary into groups of words of more or less frequent use, was employed for Dickens's "David Copperfield." It exposes the vagueness of ordinary estimates of vocabulary. *Factors in the Mental Processes of School Children* (pp. 70–92): N. CAREY. – Six groups of tests were made on four classes of girls and one class of boys in the senior department of a London County Council elementary school. One group was for discrimination, a second for memory of sense material, the third for memory of verbal memory, fourth for school subjects, fifth for estimates of school intelligence, etc., sixth for the "general factor." All the tests for each class were intercorrelated. The correlation of the general factor with scholastic intelligence is .75 and with tactile discrimination .00; the correlations of general intelligence with other tests lie between these limits. *The Formation of Projected Visual Images by Intermittent Retinal Stimulation:* II. Apparatus, Procedure, and Results (pp. 93–126): G. H. MILES. – Great individual differences exist with respect to the retino-cerebral tract as regards general sensitiveness, retentivity, and the character of the subsequent color phenomena induced by the original stimulus. A relationship appears to exist between the factors involved in the formation of the projected image and immediate visual memory. Eleven figures illustrate the apparatus used and express the results graphically. *Publications Recently Received. Proceedings of the British Psychological Society.*

Healy, William. Honesty. Childhood and Youth Series. Indianapolis: Bobbs-Merrill Company. 1915. Pp. 220.

Holt, Edwin B. The Freudian Wish and Its Place in Ethics. New York: Henry Holt and Company. 1915. Pp. vii + 212.

McTaggart, J. Ellis. Human Immortality and Pre-Existence. New York: Longmans, Green, and Company. 1915. Pp. vii + 119. 90 cents.

Ricklin, Franz. Wishfulfillment and Symbolism in Fairy Tales. Tr. by W. A. White. Nervous and Mental Disease Monograph Series, No. 21. New York: Nervous and Mental Disease Publishing Company. 1915. Pp. iii + 90. $1.00.

NOTES AND NEWS

A MEETING of the Aristotelian Society was held on January 3, Dr. H. Wildon Carr, president, in the chair. Professor A. N. Whitehead read a paper on "Space, Time, and Relativity." Mathematicians have succeeded in defining diverse Euclidean measure-systems without any reference to distance. There are alternative groups of such congruent transformations of space all equally applicable, but, while the distance P_1P_2 may equal the

distance Q_1Q_2 for one measure-system, it will not equal it for another. The extraordinary thing is that each of us does, as a matter of fact, employ a determinate measure-system which remains the same, except probably for very small variations, and that the measure-systems of different human beings agree, within the limits of our observations. This, however, is different in regard to time. Owing to the fact that points of space are incapable of direct recognition, there is a difficulty in determining what is at rest and what is in motion, and a further difficulty of determining a definite uniform flow of time. If all physical influences require time for their propagation in space, the idea of an immediate presentation to us of an aspect of the world as it in fact is must be abandoned. What we perceive at any instant must, in that case, already be ancient history, with the dates of the various parts hopelessly mixed. Again, if all physical influence is electro-magnetic, all influences are propagated with the velocity of light *in vacuo*. But what dynamical axes are we taking as at rest? There are two possibilities. We may assume either (*a*) that one set of axes is at rest, and that the others will show traces of motion in respect to the velocity of light, or (*b*) that the velocity of light is the same in all directions whichever be the dynamical axes assumed. The first supposition is negatived by experiment, and hence we are driven to the second, which immediately lands us in the whole theory of relativity. If we will not have this theory, we must reject the supposition that the velocity of light *in vacuo* is the same in all directions. This is done by assuming an ether and a certain law for its modification. But as soon as the assumed ether has to be patched up with special properties to explain special experiments, its scientific use is problematical, and its philosophic use is *nil*. Philosophically the ether appears to be an ambitious attempt to give a complete explanation of the physical universe by making an elephant stand on a tortoise. Scientifically it has an adequate use by veiling the extremely abstract character of scientific generalizations under a myth, which enables our imaginations to work more freely.

THERE will be opened in affiliation with the Carnegie Institute of Technology, Pittsburgh, on June 1, 1916, a Bureau of Salesmanship Research. A fund amounting to $75,000 for the support of the bureau for the first five years has been provided by a group of business concerns to whose initiative the organization of the bureau is due. Among these cooperating concerns are the Westinghouse Electric and Manufacturing Company, the H. J. Heinz Company, the Armstrong Cork Company, the Equitable Life Assurance Society, the Ford Motor Company, the Carnegie Steel Company, and others. Offices, psychological laboratories and equipment have been provided by the Carnegie Institute of Technology. The aim of this bureau is to secure a broader basis of established fact for use in improving present methods of selecting and training salesmen, by accumulating and systematizing information concerning the methods now used by successful firms, by applying psychological tests to the analysis of the mental traits of successful and unsuccessful salesmen, by carrying on experiments in the selection and training of salesmen in cooperation with various firms, and by publishing the results of these studies through appro-

priate channels. The activities of the bureau will be guided by a scientific staff, on which Dr. W. D. Scott, professor of psychology in Northwestern University, serves as director, and Professors W. V. Bingham (Carnegie Institute of Technology), J. B. Miner (Carnegie Institute of Technology), and G. M. Whipple (University of Illinois), will serve as cooperating psychologists. The scientific staff will comprise, in addition to the foregoing, a research assistant and several research fellows. The fellowships, yielding from $300 to $500, will be awarded to graduate students of superior intellectual ability, personality, and leadership, who intend to fit themselves for careers as employment managers and supervisors of personnel. There will be opportunity also for students of psychology who wish to prepare doctors' dissertations in the fields of mental tests, vocational analysis, statistical method, etc. Inquiries may be addressed to W. V. Bingham, Carnegie Institute of Technology, Pittsburgh, Pennsylvania.

THE sixteenth annual meeting of The Western Philosophical Association will be held in St. Louis, Missouri, April 21 and 22, in acceptance of invitation from the department of philosophy of Washington University. The special topic will be: "The State; Its Meaning, Its Development, and Its Possibilities." The executive committee has selected this topic as timely and fruitful in view of the international situation. It is desired that consideration of it may follow the newer channels, so far as possible. The following amplification is given merely by way of suggestion: The place of the economic, the social, the ethical, and the religious factors in relation to the political, in the organization of the state; the nature, ground, and extent of the duties of citizenship; the meaning of patriotism; the merits of nationalism, imperialism, and internationalism; the value and limits of assimilation, internal and external; the criteria and conditions of progress, and its present obstacles; the applicability of theory of state to actual conditions. Papers (limited to twenty minutes) are invited, either on the special topic or on any other subject. Titles of papers, together with brief outline, should be in the hands of the secretary not later than March 25. The sessions will probably be four in number (morning and afternoon of each day), with at least one session devoted to the special topic. The president's address will follow a dinner to be given by Washington University to members of the association on Friday evening, April 21.

BERTRAND RUSSELL has accepted a call to Harvard University. He will lecture next year on logic and ethics.